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Comments on Ceylonese Snakes of the Genus *Typhlops*
with Descriptions of New Species

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ABSTRACT: Five new species of the small blind snakes of the genus *Typhlops* are described from the Island of Ceylon. These are *Typhlops lankaensis*, *T. violaceus*, *T. malcolmi*, *T. tenebrarum*, and *T. veddae*. Five other forms are reported also. These are *Typhlops braminus*, *T. porrectus*, *T. mirus*, *T. ceylonicus*, and *T. leucomelas*.

THE most recent review of the snakes of Ceylon, is included in a recent volume by Malcolm Smith, which deals with the fauna of India and southeastern Asia.* In this entire region 19 species belonging to the genus *Typhlops* Oppel are recognized, one of the species being represented by two subspecies. Of the 19 species, five are reported from the island of Ceylon. Three of these have not been found elsewhere and are presumed to be endemic. The species are:

1. *Typhlops mirus* Jan, a species described about 85 years ago, but known from very few specimens, and from the single definite locality—Peradeniya. Endemic.
2. *Typhlops leucomelas* Boulenger. Known from two specimens. Endemic.
3. *Typhlops ceylonicus* Smith. The type is the only known specimen. Endemic.
4. *Typhlops porrectus* Stoliczka. This species occurs in India and Burma. It was recorded for the first time from Ceylon in 1897 by Mchely. Smith reports a specimen from Punduloya, Ceylon.
5. *Typhlops braminus* (Daudin), a widely distributed species, long known from Ceylon.

* The Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Sub-Region: Reptilia and Amphibia, Vol. III, Serpentes, Dec. 1943, London pp. 1-XII, 1-583, text figs. 1-166, 1 map.

In the Edward H. Taylor-Hobart M. Smith Collection there are 36 examples of these diminutive, "blind" snakes from Ceylon. Most of the specimens were obtained in the region 12 miles north of Trincomalee where the land is only about three to five meters above sea level. Two are from the mountainous region near Peradeniya. Of these two specimens, one belongs to the well-known *Typhlops braminus*, the other is an example of the rare *Typhlops mirus*.

Of the 34 specimens from the region north of Trincomalee, not one seems to belong to a described species; but they are separable into several distinct forms which are here described as new. All were obtained in sandy soils. Several were found within a few feet of high-water mark on the shore of a saltwater lagoon, in debris left by the waves. The soil was disturbed to a depth of only 3 to 4 inches while looking for them. Others were found by systematically moving accumulations of leaves on the forest floor, or debris from about the base of coconut trees.

Typhlops porrectus Stoliczka

Typhlops porrectus Stoliczka, Journ. Asiat. Soc. Bengal, Vol. XL, 1871, p. 426, pl. XXV, figs. 1-4. (Type locality, Bengal, India); Méhely, Termes. Fuzetek, Vol. XX, 1897, p. 62 (Kala-wewa, Ceylon); Smith, Fauna British India, Ceylon and Burma including the whole Indo-Chinese Sub-region: Reptilia and Amphibia, Vol. III, 1943, p. 46 (Punduloya, Ceylon).

This species is widespread in India but apparently it is uncommon in Ceylon. Two records, that of Méhely in 1897, and that of Smith in 1943 are the only specimens that have been reported.

The characteristics of this species, 18 scale rows, diameter of body in length 50-60 times, an incompletely divided nasal and the 400-440 transverse scale rows, clearly separate it from other known Ceylonese forms.

Typhlops mirus Jan

Typhlops mirus Jan, Iconographie Générale des Ophiens, livr. 1, 1860, p. 9, pls. 5 & 6, fig. 7 (Type locality, Ceylon); Günther, Reptiles of British India, 1864, p. 176, pl. 16, fig. H; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 126; Boulenger, The Fauna of British India including Ceylon and Burma, Reptilia and Batrachia, 1890, p. 240; and Catalogue of the Snakes in the British Museum (Natural History), Vol. 1, 1893, p. 52; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 7-9, fig. 1; Journ. Bombay Nat. Hist. Soc., XXIX, 1923, p. 348; Smith, The Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, Vol. III, Serpentes, Dec. 1943, p. 55. (Ceylon. Known definitely from Peradeniya.)

A single specimen, EHT-HMS No. 30094, from Peradeniya, Ceylon, is in the collection. It may be well to record the characters of this specimen in some detail.

Head rounded in lateral profile, the nostrils ventrolateral, not visible from above; the width of the rostral equal to half (or slightly

more) the width of the head, and not enclosed by the nasals;† a suture completely divides the nasal, and reaches to the second labial; the area of the anterior (inferior) portion is equal to one-sixth the area of posterior (superior) portion; preocular a little smaller than ocular; no trace of eye discernible; subocular present‡ as large as ocular; dorsal head scales larger than body scales, but frontoparietal, frontal, interparietal, supraoculars and parietals smaller than ocular or preocular; first labial smaller than second; second larger than third, but much smaller than fourth; three posterior labials in contact with the subocular.

Mental distinctly larger than adjoining scales; three (or two) lower labials (second and third may be partially fused) wholly concealed when the mouth is closed. Tail lacking the terminal sharp-pointed spine, but having a low rounded elevation.

Brown above; the snout and lower parts yellowish with a sparse amount of pigment.

Scale rows about the body, 18; transverse scale rows around body, about 317;§ on tail 14. Total length, 131 mm.; tail length, 4 mm.; head width, 2.4 mm.; body width, 3.1 mm.; body width in total length, about 42 times.

There is some irregularity in the shape and size of the caudal scales. Smith (*loc. cit.*) gives the range of transverse scales as 330-360; and the maximum length, 140 mm.

Typhlops ceylonicus Smith

Typhlops mirus Wall (part), Ophidia Taprobancia or the Snakes of Ceylon; Colombo, 1923, p. 7. (In one place, in a table the nasals are reported as meeting behind rostral. At the bottom of the page he states "sometimes in contact behind the rostral.")

Typhlops ceylonicus Smith, Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Sub-Region, Reptilia and Amphibia Vol. III, Serpentes, Dec. 1943, pp. 55-56. (Type locality Peradeniya, Ceylon.)

Smith's description of the unique type follows:

"Snout rounded, strongly projecting; nostrils lateral; rostral nearly half the width of the head; nasal completely divided, the lower suture passing to the second labial, the posterior shield very large, in good contact with its fellow behind the rostral; ocular and preocular small the latter separated from the labials by a subocular, which is wedged in between them above, and is in contact with the

† Wall, *loc. cit.*, notes that the nasals are sometimes in contact behind rostral. This is the condition in *T. ceylonicus*. The specimen showing this condition may be the type of that species.

‡ Boulenger, *loc. cit.* in the "Catalogue," page 14, (key) attributes two suboculars, erroneously, to this species.

§ Counts vary within limits of two or three scale rows on most specimens of *Typhlops*, depending upon which side or which particular row is counted.

2nd, 3rd and 4th labials below; no visible eye, the ocular shield in contact with the 4th labial only; tail blunt, without terminal spine; 18 scales round the body, the diameter of which is 35 times in the total length; about 330 transverse rows of scales. Brown above yellowish-white below. Total length: 140 mm.

"Known from a single specimen obtained at Peradeniya, Ceylon. Type in the Indian Museum."

Smith points out two distinctive characters by which this differs from *mirus*; the union of the nasals behind the rostral and the stouter proportions. The diameter is contained in total length 35 times (as compared with 40-50 times in *mirus*).

Wall has regarded this form as a variant of *Typhlops mirus* Jan. I have seen no specimens.

Typhlops leucomelas Boulenger

Typhlops leucomelas Boulenger, The Fauna of British India including Ceylon and Burma, Reptilia and Batrachia. London, 1890, pp. 237-238 (Type locality Haycock Mountain, 40 mi. from Galle, Ceylon, 2,000 ft. elevation.); and Catalogue of the Snakes in the British Museum (Natural History). Vol. 1, 1893, pp. 18-19, pl. 1, fig. 4; Wall, Ophidia Taprobanica or the Snakes of Ceylon, 1921, pp. 13-15, fig. 4; and Spolia Zeylanica, Vol. XII, 1922, p. 253, and Journ. Bombay Nat. Hist. Soc., XXIX, 1923, p. 350; Smith, The Fauna of British India, Ceylon, and Burma including the whole of the Indo-Chinese Sub-Region; Reptilia and Amphibia Vol. III, Serpentes, Dec. 1943, p. 50.

Boulenger's description follows:

"Snout rounded and moderately projecting; nostrils lateral. Rostral narrow, its upper portion about one third the width of the head, extending to between the eyes; nostril between two nasals, the anterior of which is in contact with the first and second labials and extends to the upper surface of the head; a praecocular, nearly as large as the ocular, in contact with the second and third labials; eyes distinct; upper head-scales a little larger than the scales on the body; four upper labials. Diameter of body 32 times in the total length; tail slightly longer than broad, ending in a point; 22 scales round the body. Blackish brown above, pure white inferiorly.

"Total length 130 millim."

The figures four, a, b, c, Plate I, show the following additional characters: Supraoculars and parietals equal in size to, or smaller than, the frontonasal; suture of supraocular and ocular not crossing eye; second labial two-thirds as large as the third; third labial as large as fourth; three preanals present. No posterior parietal distinguishable; two postoculars; rostral narrowed almost to a point on the labial border.

M. Smith's statement concerning *leucomelas* (*loc. cit.*): "Differs from *jerdoni* as follows: Breadth of rostral above that of head;

diameter of body, etc." is not clear. It is either a *lapsus* or certain words have been accidentally dropped by the printer.

Typhlops lankaensis sp. nov.

Type: EHT-HMS No. 30062, collected 12 miles north of Trincomalee, Ceylon, Sept. 13, 1944, by Edward H. Taylor.

Paratypes: EHT-HMS Nos. 30060-30061; 30064-30071; 30073-30078; 30080-30085; 30088, 31258, all topotypes.

Diagnosis: Head oval, seen from above; suture, dividing nasal completely, reaches to preocular; 20 scale rows about body; rostral somewhat less than one-third greatest width of head; transverse scale rows about body, 229-261; generally brown to gray-brown above with very dim longitudinal dorsal lines, the median most distinct; under side of head very largely cream color.

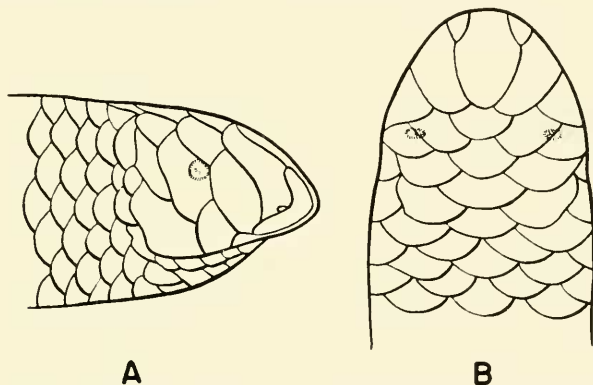


FIG. 1. *Typhlops lankaensis* sp. nov. A, lateral view of head; B, dorsal view of head. Much enlarged. From the type EHT-HMS No. 30062.

Description of type: Head oval in outline when seen from above; rostral between one-fourth and one-third the greatest width of head, failing to reach back to level of eye by a distance less than half the width of the prefrontal; nasal completely divided, the suture emerging at preocular, the upper (posterior) part distinctly longer and about a fourth larger than lower (anterior) part; median head scales wider than long, the prefrontal smaller than the frontal; latter scale smaller than the interparietal; the scale following interparietal, is wider but shorter than that scale; supraocular larger than any of the median scales, and likewise larger than parietals.

Four labials, the first two-thirds of second; fourth two and one-half times the size of third; ocular shorter but wider than preocular;

a single postocular; three lower labials, or the second may be partially fused with third which is large and concealed when mouth is closed.

Body scales in 20 longitudinal rows; individual scales usually wider than long, the median ventral series slightly wider and slightly larger than adjoining rows throughout the greater part of length. Transverse scale rows about 256 around body, 12 on tail; five somewhat enlarged, transparent anal scales, the outer, lateral, larger than the medial scales.

Color: Above light brown, darker dorsally, lighter laterally and ventrally; ventral and lateral parts of head immaculate cream; subsquamous glands on head distinctly outlined forming an intricate pattern; scales on 9 dorsal rows slightly lighter on the edges, so that 7 (or 9) dim, scarcely discernible lines are formed on dorsal longi-

Table of scale counts and measurements of *Typhlops lankaensis*

Number	Transverse scale rows body	Transverse scale rows on tail	Longitudinal scale rows	Total length	Tail length	Body width
30060.....	231	14	20	101	4.45	3.5
30061.....	244	11	20	82	3.0	3.0
30062.....	256	12	20	117	3.0	3.8
30064.....	254	13	20	103	3.5	3.5
30065.....	243	13	20	116	4.7	3.3
30066.....	253	13	20	112	3.3	3.8
30067.....	258	15	20	116	3.9	3.85
30068.....	261	13	20	119	3.0	3.5
30069.....	240	14	20	96	4.3	3.0
30070.....	240	14	20	91	3.3	3.15
30071.....	254	13	20	101	4.3	3.7
30073.....	243	14	20	96	3.8	3.2
30074.....	245	13	20	103	4.5	3.0
30075.....	258	12	20	130	3.8	3.9
30076.....	229	15	20	97	4.35	3.4
30077.....	259	14	20	116	4.5	3.8
30078.....	257	14	20	114	4.0	3.8
30080.....	255	13	20	78	3.5	2.6
30081.....	246	13	20	100	3.2	2.7
30082.....	253	14	20	104	4.0	3.3
30083.....	240	14	20	102	4.1	3.3
30084.....	249	11	20	115	3.2	3.5
30085.....	237	13	20	92	3.3	3.0
30088.....	240	13	20	104	4.0	3.3
31255.....	245	13	20	67	2.4	2.3

tudinal scale rows. An unpigmented area about vent, cream; the terminal tail spine grayish.

Measurements: Total length, 117 mm.; tail length, 3 mm.; width of body, 3.8 mm.; width in total length, about 30 times.

Remarks: The very low number of the transverse rows of scales seems to distinguish this species from other Ceylonese species as well as from the continental forms.

The ancient name for the island of Ceylon is Lanka. It is from this that the specific name has been derived.

Typhlops violaceus sp. nov.

Type: EHT-HMS No. 30091; collected 12 miles north of Trincomalee, Ceylon, Oct. 5, 1944, by Edward H. Taylor.

Diagnosis: A small *Typhlops* with eyes dim, but discernible; the nasal completely divided; the nostril lateral but not visible above, the suture dividing nasal touching the preocular far from the labial; 20 longitudinal scale rows; none or only a very small terminal spine; 245 transverse scale rows on body; body width in total length about 31 times. Color, dull violet to lavender, almost the same above and below.

Description of type: Head somewhat truncate-oval seen from above, the snout rather bluntly wedge-shaped in lateral profile, the top of head flattened; rostral tongue-shaped, failing to reach back to eye level by a distance equal to about two-thirds width of the prefrontal; nasal completely divided, the suture reaching the preocular at some distance from the labial, the upper part being about a fifth greater in area than the lower, and its greatest width a little more than that of the preocular; the lateral sutures formed by the rostral with the anterior part of the nasal show slight depressions noticeable when seen from below; preocular larger than the ocular, and much longer; prefrontal scarcely wider than long; frontal and first interparietal about equal in size, both larger than prefrontal but distinctly smaller than the second interparietal; supraocular largest of these scales and more irregularly shaped, its lower edge crossing the eye, the suture with the preocular much in front of eye; parietals, both anterior and posterior, about equal to last interparietal; body scales following are smaller (less than half) than head scales; four upper labials, first two-thirds of second; second about a half area of third; third a little more than half of fourth. Preanal scales, five, the outermost much enlarged; ap-

parently no terminal spine or at most only a diminutive one (terminal scale shed). Terminal part of tail not bent down strongly.

Scales on body rather strongly rounded behind, in 20 longitudinal rows; transverse rows, 245 about body, 13 on tail.

Color: Above and below dull violet to lavender, only slightly lighter below; scales about mouth light, with some very slight pigmentation.

Measurements: Total length, 111 mm.; tail, 2.5 mm.; diameter of body, 3.6 mm.; body width in total length about 31 times.

Typhlops braminus Daudin

Eryx braminus Daudin, *Histoire Naturelle générale et particulière des Reptiles*, Vol. VII, year XI (= 1803), pp. 279-280. Based on Russel's *Rondou-Taloulou-pam* in, *An account of Indian Serpents collected on the Coast of Coromandel*, Vol. I, p. 48, pl. XLIII (Type locality Vizagapatam, India).

Typhlops braminus Boulenger, *Catalogue of the Snakes in the British Museum (Natural History)*, Vol. I, 1893, p. 16; Wall, *Ophidia Taprobanica or the Snakes of Ceylon*; Colombo, 1921, pp. 7, 9-13 (figures apparently represent another species); Smith, *The Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Sub-Region; Reptilia and Amphibia*, Vol. III, *Serpentes*, Dec. 1913, pp. 46-48, fig. 14, head.

This very widespread species, *Typhlops braminus* has been reported by Wall as being "very abundant" in Ceylon. Boulenger, *loc. cit.* lists three Ceylon specimens. In the EHT-HMS collection is a specimen from Peradeniya, Kandy District (No. 30093). Although it is somewhat faded it agrees with *T. braminus* in the scale characteristics and counts.

I strongly suspect that Wall (*loc. cit.*) has confused more than one species with *T. braminus*. The figures he gives, if correctly drawn, cannot belong to this species, but represent an undescribed form. The rostral widens anteriorly instead of narrowing; the character of the dorsal head scales is different; three instead of five preanal scales are shown. It may be that the species here described as *T. lankaensis* was likewise confused with *T. braminus* by Wall since superficially they resemble each other, and it is likely that specimens of that species are present in the collections that Wall examined.

The specimen, No. 30093, has 317 transverse scale rows about the body, and 15 about the tail. The total length is 123 mm., the diameter of the body (3.1 mm.) about 40 times in length. There are 20 longitudinal scale rows on the body. The rostral is a little less than a third the width of the head, widest near the posterior end, narrowing anteriorly; the suture of the completely divided nasal reaches the preocular. Under part of the snout, the anal region and the terminal spine cream or whitish. In life the dorsal coloration

is blackish or blackish brown above and somewhat lighter on the ventral surfaces. There is no subocular present.

The range of the transverse scale rows (ventrals) for *Typhlops braminus* is given by Smith, *loc. cit.* as 290-320; the diameter of the body, contained in total length, varying between 30-45 times; greatest length 170. Smith points out that the internasal suture which usually touches the preocular may sometimes touch the second labial, noting that certain forms in India previously described as new, should be regarded merely as synonyms. This may be true in certain cases, but in others not only the condition of the nasal suture, but other characters as well might warrant a separation. The matter should be reëxamined when more material is at hand.

Typhlops malcolmi sp. nov.

Type: EHT-HMS Nos. 30072; collected 12 miles north of Trincomalee, Eastern Province, Ceylon, Nov. 1944, by Edward H. Taylor.

Paratype: No. 30090, same data, Oct. 5, 1944.

Diagnosis: A small bicolored snake having 20 longitudinal scale rows. 261-273 transverse scale rows around body; fourth labial twice as large as third, notched behind; a single postocular present; brown above and cream below with a brownish pigmented band crossing throat. Glands on head form a distinct, lighter pattern.

Description of the type: Rostral rather elongate, reaching back to level of the middle of the eyes, beginning to narrow at the most posterior point of lower nasal; nasal completely divided by a suture which terminates at the second labial; the lower, anterior portion somewhat more than one-half the area of the upper, posterior part; posterior nasals not in contact behind rostral; prefrontal slightly smaller than ocular, followed by a frontal slightly wider but of the same shape; the suture of the ocular with supraocular crosses the eye; suture between the supraocular and the preocular barely touches the anterior edge of the eye; two parietals and two interparietals, the anterior parietals largest; preocular as wide as ocular but higher.

Four labials, first about one-half area of second; second two-thirds the area of the third; third a little less than half the area of the fourth; latter slightly notched on its posterior border; a single postocular present; lower lip bordered by a very tiny mental and two labials, a small anterior and a greatly elongated and narrow posterior reaching to angles of the mouth; tail ending in a blunt spine; five preanal scales, the outer one on each side, largest.

The transverse scale rows on the body 262, those on tail 11. Longitudinal scale rows 20; length 107 mm.; width 3.45 mm.; width in total length about 31 times. Tail length 4.5 mm.; head width 2.8 mm.

Color in life: Above brown on the eight dorsal rows, the color heaviest on the median dorsal rows, and lighter on the sides; two other lateral rows with some pigment; lower lateral and ventral rows dull cream to flesh color lacking pigment save for a light brownish band several scales wide crossing the throat.

The paratype, No. 30090, has 273 transverse scale rows on body and 9 on the tail; there are 20 longitudinal rows around the body. The total length is 81 mm., the tail 2.2 mm., head width 2 mm., width of body 2.6 mm., width into body length about 31 times.

The coloration conforms to that of the type save that it is definitely lighter. The band of pigment crosses the throat as in the type. The terminal spine is without pigment.

The relationship appears to be with *Typhlops leucomelas*, but it may be distinguished by the smaller number of longitudinal scale rows, lighter color, the band of color about throat and the different labials.

This is a lowland species living in sand on the forest floor.

The species is named for Malcolm Smith, now of the British Museum of Natural History, who has published widely on the herpetology of Southern Asia.

Typhlops tenebrarum sp. nov.

Type: EHT-HMS No. 30063; collected 12 miles north of Trincomalee, Ceylon, Oct. 5, 1944, E. H. Taylor, collector.

Paratypes: EHT-HMS Nos. 30079, 30086, 30087, all topotypes.

Diagnosis: A very slender *Typhlops* with the nasal suture com-

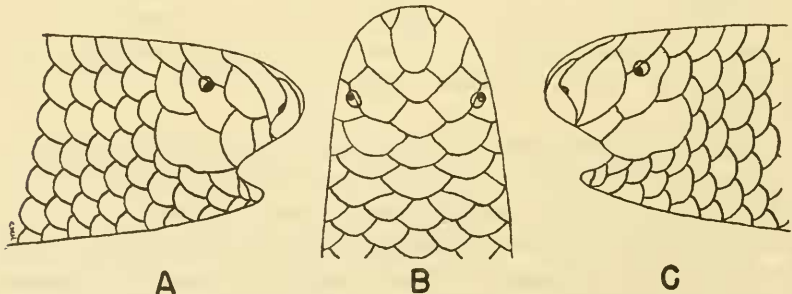


FIG. 2. *Typhlops tenebrarum* sp. nov. Views of head. A, lateral view; B, dorsal view; C, lateral view of left side, showing presumed abnormal condition. All figures much enlarged. From the type EHT-HMS No. 30063.

pletely dividing the nasal and reaching the second labial; width contained in length from about 43 to 56 times; number of transverse scale rows about body from about 298 to 326 rows; 12 to 14 on tail; 20 longitudinal scale rows about body; light brown above, lighter below and on sides; scales bordering the mouth cream color.

Description of the type: Seen from above, the head is rounded anteriorly; greatest width of rostral one-third (or slightly less than) greatest width of head; rostral widest where scale touches most posterior (upper) part of the anterior (lower) nasal, then narrows, the sides being parallel almost to the border of mouth; the suture which completely divides the nasals emerges at the second labial, the lower part much more than half the area of the upper part; prefrontal about as wide as long, separating upper nasals, about the same size and shape as the frontal, and the anterior interparietal; posterior interparietal larger than other scales of the median row; supraocular larger than the prefrontal or frontal, its lower edge crossing eye near middle; preocular a little larger than ocular; a single postocular; eye rather indistinct, seen as a rather blackish spot (somewhat more distinct in younger specimens); four upper labials, first about a third the area of second; latter much less than half of third; fourth labial nearly double area of third (on left side the second labial is anomalously missing, partially fused to preocular, partly to third labial, the suture reaching the reconstructed third labial); three lower labials but the second and third apparently almost completely fused, concealed when mouth is closed.

Scales in 20 longitudinal rows; transverse scale rows about 320 on body, 12 on tail; preanals five, largely transparent, the outer scales largest.

Measurements: Total length, 111 mm.; tail, 2 mm.; width of body, 2.5 mm.; body width in total length, about 44 times.

Table of variation for *Typhlops tenebrarum*

Number	Transverse rows, body	Transverse rows, tail	Longitudinal scale rows	Total length	Tail	Diameter of body
30063.....	320	12	20	111	2.0	2.5
30079.....	300	13	20	112	3.0	2.0
30086.....	298	14	20	70	1.9	1.55
30087.....	326	13	20	65	1.8	1.5

Color: Above brownish to dull chestnut, the pigment more dense on the nine dorsal rows, lighter on lower laterals and ventrals; scales about mouth cream color.

Variation: The three topotypic paratypes show certain variations. The following table indicates variation in scale counts and measurements:

In all the specimens the suture of the nasals reaches to the second labial; a small terminal spine is present, sometimes blunt.

No. 30079 shows a singular variation in having the ocular and the supraocular fused for the greater part of the common suture, and the eyes are distinct; the tail curves sharply down at tip.

No. 30086 has the second interparietal abnormally broken.

Typhlops veddae sp. nov.

Type: EHT-HMS No. 30089; collected 12 mi. north of Trincomalee, Ceylon, Sept. 29, 1944, by E. H. Taylor.

Diagnosis: A very slender *Typhlops* having 20 scale rows, no subocular, the nasal suture to the second labial, the rostral short failing to reach back to eye level by a considerable distance; head somewhat narrowed, and truncate anteriorly; the transverse scale rows about body 295; 14 caudal rows; body width in length about 60 times.

Description of type: Width of the rostral about one-third the width of head at the level of eyes, failing to reach anterior level of eyes by three-fourths the width of prefrontal; nostril between two completely divided nasals, the upper nearly double area of the lower but not meeting its fellow behind rostral, the suture reaching

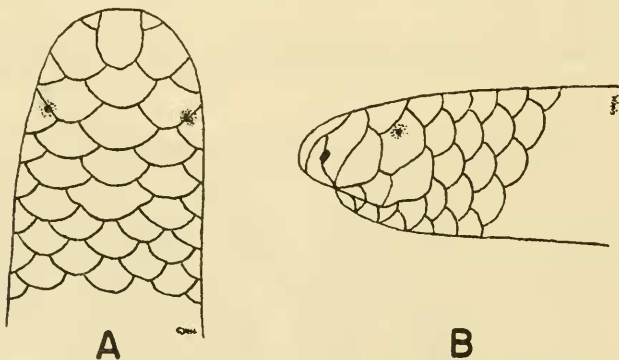


FIG. 3. *Typhlops veddae* sp. nov. A, dorsal view of head; B, lateral view of head. From the type EHT-HMS No. 30089. Much enlarged.

to the second labial; median head scales, the prefrontal, frontal, and interparietals, all about the same size and all broader than long; supraoculars, anterior and posterior parietals of nearly same shape but a trifle smaller than head scales of the median row; the fourth scale in this series not or only slightly enlarged; four upper labials, the fourth about one and one-third times larger than third; suture from the nostril reaching second labial which is about half as large as third; two lower labials on each side, concealed when mouth is closed; preocular about as large as the ocular, their common suture distinctly in front of eye; suture between the ocular and supraocular crosses upper edge of eye; scales of head all showing minute spinules. Eye a dim black spot, easily discernible.

Head seen from above tapers slightly to the somewhat truncate snout; in lateral profile the snout slopes downward from posterior part of nostral but the tip of the snout is rounded; subsquamous glands of head scarcely discernible, save along the edges of rostral.

Scales about body in 20 longitudinal rows and in about 295 transverse rows; 13-14 rows around tail; preanal scales five, somewhat enlarged; tail terminating in a small, rather indistinct spinelike scale.

Color: Lavender-gray throughout, with some trace of darker markings on scales when studied under a lens (especially on ventral scales); no trace of lighter areas on head, anal region, or tail. Total length, 90.5 mm.; body width (average), 1.51 mm.; head, 1.5 mm.; tail, 2.75 mm.

Remarks: The species, judging by its very slender habitus, and the large number of transverse scale rows is related to *Typhlops braminus*, and to *Typhlops tenebrarum*, described herein. It differs from the former in coloration, characteristic pattern of glands, in having the nasal suture touch the labial rather than the preocular. The shape of the head and particularly the shape of the snout, is quite different; the eye is dim, and the diameter of the body is contained into its length 60 instead of "30-45" times and the tail is proportionally longer.

The type was taken from decaying wood debris, in second growth forest.

The Veddas are an ancient people of Ceylon, now represented by small groups occupying a few villages in the wilder parts of the island.

DISCUSSION

Of the five new species described here, *Typhlops lankaensis* has probably been collected before, but its superficial resemblance to *T. braminus* may have caused it to be confused with that species. In the past many herpetologists have failed to make counts of transverse scale rows in these snakes and as a consequence they have overlooked striking differences in forms they have regarded as conspecific.

Fortunately there is a good series of *T. lankaensis* from a single locality, and the variation that obtains cannot be attributed to geographical variation. It is a common species but considerable effort is necessary to find it.

In passing, it may be said that in this species and perhaps many other species of *Typhlops* there are two transverse scale rows for each vertebra rather than a single one, such as is true for the greater number of snakes. However in some forms, *T. beddomei* Boulenger for example, with an extraordinarily low count of only 190-200 transverse rows perhaps only a single scale now corresponds to a single vertebra; and in a form such as *T. thurstoni* Boettger with the remarkable count of 550-600 transverse rows, perhaps more than two rows correspond to a vertebra. No specimens of these forms are available to me for examination.

Typhlops malcolmi with 20 longitudinal rows is clearly distinguished from *T. leucomelas* with 22 longitudinal rows. It may also be distinguished by color differences—black dorsally in *T. leucomelas* and brown in *T. malcolmi*. There are also differences in the relative sizes of the labials. *T. malcolmi* has a band of pigment across the throat, lacking in *leucomelas*. It would appear that *T. leucomelas* is a mountain form, while known specimens of *T. malcolmi* are from the sandy northern lowlands.

The "key" differences between *Typhlops violaceus* and *T. lankaensis* may seem unimportant. However the shape of the head, and the resultant changes in scale proportions make for distinct differences that are rather hard to put into words. In *violaceus* the snout extends farther in front of the mouth, and the point at which the nasal suture reaches the preocular is about double the distance from the edge of the mouth as the same point in *T. lankaensis*. The part of the rostral visible above in *T. violaceus*, especially the anterior narrowed part, is very much longer than the same part in *T. lankaensis*. Color alone will separate the species, and numerous

other differences become obvious when individual scales are compared.

The two species *Typhlops veddae* and *T. tenebrarum* resemble *T. braminus* in the counts of the transverse scale rows, and by this same character are separable from *T. lankaensis* and *violaceus*.

They both differ from *T. braminus* in having the terminus of the nasal suture at the first labial rather than at the preocular, thus bringing the point of contact close to the mouth with the resultant differences in scale proportions and relationships. The body in these two species is distinctly slenderer than the body in *T. braminus*. The distinctions between *T. veddae* and *T. tenebrarum* are pointed out in the key.

One must not overlook the possibility that certain Indian forms now in synonymy may prove to be distinct species when sufficient specimens are available to prove them part of distinctive populations and not anomalies.

It is more or less consistent behavior of genera of burrowing species of snakes to diversify in greater extent than more terrestrial or arboreal forms thus less handicapped in movement. Burrowing habits make for lack of mobility and serve in a measure as an isolating factor.

KEY TO THE SPECIES OF TYPHLOPS IN CEYLON

1. Scales in 18 longitudinal rows about body; nasal variable..... 2
Scales in 20 or 22 rows about body; nasal divided..... 4
2. Nasal incompletely divided, the suture to 2d labial; no subocular; small terminal tail spine; eye distinct; 330-360 transverse scale rows; length 285 mm.: Blackish brown above, paler below.....*T. porrectus*
Nasal completely divided, the suture to 2d labial; a subocular present; no terminal tail spine; eye usually not visible..... 3
3. Upper (posterior) nasals separated behind rostral; 330-360 transverse scale rows on body, brown above paler below, length 140 mm.; head partly or almost entirely cream*T. mirus*
Upper (posterior) nasals forming a median suture behind the rostral; 330 transverse scale rows on body; brown above, yellowish white below; length 140 mm.,
T. ceylonicus
4. Scales in 20 longitudinal rows about body..... 5
Scales in 22 longitudinal rows about body; eye distinct; nasal suture to 2d labial; (260-280 scale rows, said to agree with *jerdoni*). Black above, whitish below, the colors meeting in a clear line of demarcation; length 130 mm.,
T. leucomelas
5. Nasal suture goes to the preocular..... 7
Nasal suture goes to second labial..... 10
7. Transverse rows of scales on body more than 280..... 9
Transverse scale rows on body less than 275..... 8
8. Transverse scale rows, 229-261 on body; subsquamous glands on head forming distinct pattern; eye distinct; underside of head largely cream; part of rostral visible above shorter; length 130 mm.....*T. lankaensis*
Transverse scale rows on body, 245; subsquamous glands on head not visible; eye rather indistinct; part of rostral visible above much elongate; snout somewhat truncate at tip; dull violet to lavender; length, 111 mm.....*T. violaceus*

9. Transverse scale rows on body, 290-330. Pattern of subsquamous glands distinct; eye normally distinct; blackish brown above, paler below; length 170 mm. *T. braminus*
10. Body more attenuated; transverse scale rows on body above 290..... 11
 Body less attenuated; transverse scale rows 261-273, body brownish above, the pigment becoming less on sides; venter cream save for a pigmented band on throat; eye distinct; width into body length, about 31 times; length, 107 mm.,
T. malcolmi
11. Transverse scale rows, 298-326; width of the body into length about 43 to 56 times; light brown above, lighter below. Scales bordering mouth cream; snout rounded anteriorly; upper nasal one-third larger than lower. 3d labial about half area of fourth; length 112 mm..... *tenebrarum*
 Transverse scale rows 295; body width into total length about 60 times; head truncate, subsquamous glands not or scarcely discernible; length 90 mm... *veddae*